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AUTHOR: Skorokhod, A. V.

TITLE: Existence and uniqueness of solutions of stochastic diffusion equations

PERIODICAL: Sibirskiy matematicheskiy zhurnal, v. 2, no. 1, 1961, 129-137

TEXT: The author proves an existence and uniqueness theorem for the differential equation: $d\xi(t) = a(t,\xi(t))dt + \sigma(t,\xi(t))dw(t)$ (1), where $\sigma^2(t,x)$ denotes the diffusion coefficient, $a(t,x)$ is the transport coefficient, and $w(t)$ is a function that describes the one-dimensional Brownian movement. For such equations, existence and uniqueness theorems have been derived by K. Ito, I. I. Gikhman, J. Doob, and Maruyma on the following assumptions: There exists a number K and thus

$$|a(t,x)|^2 + |\sigma(t,x)|^2 \leqslant K(1 + x^2);$$ for every $C > 0$, there exists a number L_C and thus $|\sigma(t,x) - \sigma(t,y)| + |a(t,x) - a(t,y)| \leqslant L_C|x - y|$ for $|x| \leqslant C$, $|y| \leqslant C$. The existence and uniqueness theorem by the present author reads as follows: If ξ_0 is a random quantity independent of $w(t)$; if $a(t,x)$

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and $\sigma(t,x)$ are continuous functions for $t \in [t_o, T]$ and $x \in (-\infty, \infty)$; and if there exists a number K so that $(a(t,x))^2 + (\sigma(t,x))^2 \leq K(1 + x^2)$ holds for all x, then equation (1) has exactly one continuous solution $\xi(t)$ with the probability 1, defined on the interval $[t_o, T]$, which satisfies the initial condition $\xi(t_o) = \xi_o$. If, in addition, $t \in [t_o, T]$; $x \in (-\infty, +\infty)$ $\sigma(t,x) > 0$, and if there exist numbers $\alpha_C > 1/2$ and $L_C > 0$ for every $C > 0$ so that for $|x| < C$, $|y| \leq C$ one has $|\sigma(t,x) - \sigma(t,y)| \leq L_C(x - y)^{\alpha_C}$, then the solution $\xi(t)$ is unique inasmuch as it is in agreement with any other solution with the probability 1. For the proof of existence, the author uses a theorem by A. N. Kolmogorov. There are 12 references: 7 Soviet-bloc and 5 non-Soviet-bloc.

SUBMITTED: March 11, 1960

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25766
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C111/C222

AUTHOR: Skorokhod, A.V.

TITLE: Stochastic equations for diffusion processes in a bounded region

PERIODICAL: Teoriya veroyatnostey i yeye primeneniye, v. 6, no. 3, 1961, 287 - 298

TEXT: At the conference on probability theory and mathematical statistics in Yerevan, 1958, it was reported about the results of the paper.
From the results of Feller (Ref. 7: W. Feller, Diffusion processes in one dimension, Trans. OMS, 77 (1954), 1(31) ; Ref. 8 : W. Feller, The general diffusion operator and positively preserving semigroups in one dimension, Ann. Math., 60(1954), 417-435) it follows that in the case of continuous trajectories of a diffusion process at the boundary there is either absorption or instantaneous reflection or retarded reflection or partial reflection. The author tries to construct the trajectories of processes with boundaries being analogous to those considered by Feller but which must not necessarily be homogeneous.

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Stochastic equations for diffusion ... C111/C222

The author considers only one-dimensional diffusion processes on the semiline $x \geqslant 0$. The single boundary point reads $x = 0$. It is assumed that the diffusion coefficients $a(t,x)$ and $\sigma(t,x)$ are defined and continuous for $x > 0$, $t \in [t_0, T]$ and satisfy

$$|a(t,x) - a(t,y)| \leq K|x - y| , \quad |\sigma(t,x) - \sigma(t,y)| \leq K|x - y| . \qquad (3)$$

The case of an instantaneous reflection is considered in detail. Let $\xi(t)$ be a process. The function $\zeta(t)$ is called a "reflection function" of $\xi(t)$ if $\zeta(t)$ with a probability 1 is a continuous monotone function the growth points of which can only be the zeros of $\xi(t)$. The process with an instantaneous reflection is sought as a solution of

$$\xi(t) = \xi(t_0) + \int_{t_0}^{t} a(s,\xi(s))ds + \int_{t_0}^{t} \sigma(s,\xi(s))dw(s) + \zeta(t) \quad (5)$$

where $\zeta(t)$ is the reflection function of $\xi(t)$, $\zeta(t_0) = 0$ and $\xi(t) \geqslant 0$ for all t. Since the set of t - values for which $\xi(t) = 0$, has the Lebesgue measure 0 then it is unessential how $a(t,x)$ and $\sigma(t,x)$ are

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defined in $x = 0$; $w(t)$ is the Brownian motion.
It is proved that (5) has a unique solution for a single possible function $\zeta(t)$, where $\zeta(t)$ has the property

$$\lim_{\Delta t \downarrow 0} \frac{\zeta(t + \Delta t) - \zeta(t)}{\sqrt{\Delta t}} = \sqrt{\frac{\pi}{8}}\, \sigma(t, +0)\, \psi_0(\xi(t)) \qquad (6)$$

for almost all points ; $\psi_0(x) = 0$ for $x > 0$ and $\psi_0(x) = 1$ for $x = 0$.
The integral form for (6) reads :

$$\zeta(t) = \sqrt{\frac{\pi}{8}} \int_{t_0}^{t} \sigma(s, +0)\, \psi_0(\xi(s))\, \sqrt{ds}$$

so that the equation of a process with an instantaneous reflection can also be written in the form

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$$\xi(t) = \xi(t_0) + \int_{t_0}^{t} a(s,\xi(s))ds + \int_{t_0}^{t} \sigma(s,\xi(s))dw(s) + $$

$$+ \sqrt{\frac{\pi}{8}} \int_{t_0}^{t} \sigma(s, +0)\,\psi_0(\xi(s))\sqrt{ds} \qquad (7)$$

Since it is proved that (5) may have a solution only for a single $\zeta(t)$, for the proof of existence it must be found at least one $\zeta(t)$ for which (5) has a solution. For this aim the author considers differential equations. Let $t_0 < t_1 < t_2 < \ldots < t_n = T$; $t_{k+1} - t_k = \Delta t_k, w(t_{k+1}) - w(t_k) = = w_k$. Let $h_1, h_2, h_3, \ldots h_n$ be a sequence of positive random magnitudes; let η_0 be a random magnitude not depending on $w(t)$. Let the sequence η_k , $k = 1,2,\ldots,$ n be defined by

$$\eta_k = \eta_{k-1} + \sigma(t_{k-1}, \eta_{k-1})w_{k-1} + a(t_{k-1}, \eta_{k-1})\Delta t_{k-1} +$$
$$+ \psi_0(\eta_{k-1} + \sigma(t_{k-1}, \eta_{k-1})w_{k-1} + a(t_{k-1}, \eta_{k-1})\Delta t_{k-1})h_k \quad , \tag{1.2}$$

where $\psi_0(x) = 1$ for $x \leq 0$ and $\psi_0(x) = 0$ for $x > 0$. Let the random process $\eta(t)$ be defined by : $\eta(t) = \eta_k$ for $t \in [t_k, t_{k+1})$, $k = 0, 1, \ldots, n - 1$. It is shown that for $\max \Delta t_k \to 0$, $\eta(t)$ converges to a solution of (5).

A continuation of the paper is announced. The author mentions S.N. Bernshteyn, I.I. Gikhman and A.D. Ventsel'. There are 6 Soviet-bloc and 7 non-Soviet-bloc references. The references to the four English-language publications read as follows : K. Ito, On stochastic differential equations, Mem.Am.Math.Soc.4(1951),1-51 ; J.Doob, Martingales and one-dimensional diffusion,Tr.AMS,78(1955),168-208 ; W.Feller, Diffusion processes in one dimension, Trans.OMS,77(1954), 1(31) ; W.Feller, The general diffusion operator and positively preserving semigroups in one dimension,

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Stochastic equations for diffusion ...

Ann. Math., 60 (1954), 417 - 435.

SUBMITTED: September 15, 1959

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SKOROKHOD, A.V.

Integrodifferential equations associated with solutions of stochastic equations. Dop.AN URSR no.7:854-858 '61. (MIRA 14:8)

1. Kiyevskiy gosudarstvennyy universitet. Predstavleno akademikom AN USSR B.V.Gnedenko [Hniedenko, B.V.]
(Integrodifferential equations)

28687

S/021/61/000/009/002/012
D274/D304

16.6100 16.4500

AUTHOR: Skorokhod, A.V.

TITLE: On the existence of solutions to stochastic equations

PERIODICAL: Akademiya nauk UkrSSR. Dopovidi, no. 9, 1961, 1119-1121

TEXT: Ito's stochastic equation

$$\xi(t) = \xi(t_0) + \int_{t_0}^{t} a(s, \xi(s))ds + \int_{t_0}^{t} \sigma(s, \xi(s))dw(s) +$$

$$+ \int_{t_0}^{t}\int f(s, \xi(s), u)q(ds \times du) \qquad (1)$$

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On the existence ... S/021/61/000/009/002/012
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is considered (Ref. 1: Matematika sb. perevodov, 1:1, 78, 1957). Ito established that (1) has a single solution if a K can be found so that

$$|a(t,x) - a(t,y)|^2 + |\sigma(t,x) - \sigma(t,y)|^2 + \int |f(t,x,u) - f(t,y,u)|^2 \frac{du}{u^2} \leqslant K|x - y|^2$$

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The existence of the solution to (1) can be proved under less rigorous conditions. Theorem: (1) has a solution if: 1) $a(t,x)$ and $\sigma(t,x)$ are continuous for $x \in R^1$, $t \in [t_0, T]$; 2) for all $t_1 \in [t_0, T]$, $x_1 \in R^1$ the condition

$$\lim_{\substack{t \to t_1 \\ x \to x_1}} \int |f(t,x,u) - f(t_1,x_1,u)|^2 \frac{du}{u^2} = 0$$

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is satisfied; 3) a number K can be found so that

$$|a(t,x)|^2+|\sigma(t,x)|^2+\int|f(t,x,u)|^2\frac{du}{u^2}\leq K(1+x^2)$$

4) f(t,x,u) is bounded in each bounded domain of variation of x and u and for each t_0, x_0 f(t,x,u) continuous in t,x at t_0, x_0 for nearly all u. a(t,x), $\sigma(t,x)$, f(t,x,u) - are functions determined for $t\in[t_0,T]$, $x\in R^1$, $u\in R^1$, w(t) - describes the Brownian movement, q(A)=p(A)-Mp(A)). The proof of the theorem involves three lemmas. The third lemma is: Let the sequence of stochastic continuous processes $\xi_n(t)$ (possibly vectorial processes) satisfy the conditions

$$\lim_{C\to\infty}\overline{\lim_{n\to\infty}}\sup_t P\{|\xi_n(t)|>C\}=0$$

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On the existence ...

and b) for each positive ε:

$$\lim_{h\to 0}\lim_{n\to\infty}\sup_{|t_1-t_2|\leqslant h} P\{|\xi_n(t_2)-\xi_n(t_1)|>\varepsilon\} = 0$$

Then it is possible to find such sequences n' and to construct such processes $\tilde{\xi}_{n'}(t)$ whose distributions converge to the corresponding distributions of the processes $\xi_{n'}(t)$, and the processes $\tilde{\xi}_{n'}$ converge to some process $\tilde{\xi}(t)$. This lemma is proved. Thereupon, using the three lemmas, the theorem itself is proved. There are 2 references: 1 Soviet-bloc and 1 non-Soviet-bloc (which is Ito's article, translated into Russian).

ASSOCIATION: Kyyivs'kyy derzhavnyy universytet (Kyyiv State University)

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16,6100

S/021/61/000/011/001/011
D299/D304

AUTHOR: Skorokhod, A. V.

TITLE: A limit theorem for Markov chains

PERIODICAL: Akademiya nauk UkrRSR. Dopovidi, no. 11, 1961, 1408-1411

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TEXT: A theorem ist stated giving the sufficient conditions under which a finite-dimensional Markov distribution converges to the corresponding distribution $\xi(t)$ which satisfies Ito's stochastic equation (Ref. 1: K. Ito, Matematika, sb. perevodov (translations), 1:1, 78, 1957). Assume the quantities $\xi_{n0}, \xi_{n1}, \ldots, \xi_{nn}$ form a Markov chain $P_{nk}(x,A) = P\{\xi_{nk+1} \in A/\xi_{nk} = x\}$. Assume further that $0 = t_{n0} < t_{n1} < \ldots < t_{nn} = 1$ is a sequence of the interval $[0,1]$, for which $\lim_{n\to\infty} \max_k \Delta t_{nk} = 0$, where $\Delta t_{nk} = t_{nk+1} - t_{nk}$. The process $\xi_n(t)$ is considered, for which $\xi_n(t) = \xi_{nk}$, if $t \in (t_{nk}, t_{nk+1})$. The condi-

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tions are ascertained, under which the distributions of $\xi_n(t)$ converge to the distributions of $\xi(t)$ which satisfies the stochastic equation

$$\xi(t) = \xi(0) + \int_0^t a(s,\xi(s))ds + \int_0^t \sigma(s,\xi(s))dw(s) + $$

$$+ \int_0^t\int f(s,\xi(s),u)q(dsxdu) \qquad (1)$$

where w(s) describes the Brownian motion and $q(A)+\int\int$ is Poisson's measure. The following theorem is proved: Let a(t,x), $\sigma(t,x)$ and f(t,x,u) be quantities for which the following conditions are satisfied: 1) A quantity K exists for which

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$$|a(t,x)|^2+|\sigma(t,x)|^2+\int f^2(t,x,u)\,\frac{du}{u^2}\leqslant K(1+x^2),$$

$$|a(t,x)-a(t,y)|^2+\sigma(t,x)-\sigma(t,y)|^2+\int|f(t,x,u)-$$
$$-f(t,y,u)|^2\,\frac{du}{u^2}\leqslant K|x-y|^2$$

2) $a(t,x)$ and $\sigma(t,x)$ are continuous functions; 3) $f(t,x,u)$ is a bounded function and $f(t_n x_n,u)\to f(t,x,u)$ when $t_n\to t$, $x_n\to x$; 4)

$$\alpha_{nk}=M(|a(t_{nk},\tilde{\xi}_{nk})-a_r(t_{nk},\tilde{\xi}_{nk},\delta_n)|^2+|\sigma(t_{nk},\tilde{\xi}_{nk})-\sigma_n(t_{nk},\tilde{\xi}_{nk},\delta_n{}^2+$$

$$+ \int_{|u|>\delta_n} |f_n(t_{nk},\tilde{\xi}_{nk},u) - f(t_{nk},\tilde{\xi}_{nk},u)|^2 \frac{du}{u^2} \tag{4}$$

5) if $\varepsilon_n \to 0$, where $\varepsilon_n = \sup\limits_{k,x,u \leqslant \delta_n} |f_n(t_{nk},x,u)|$, and $1/\delta_n^2 \max \Delta t_{nk} \to 0$, when $n \to \infty$, then the distribution ξ_{n0} tends to the distribution $\xi(0)$. Then the finite dimensional distributions of the process $\xi_n(t)$ converge to the corresponding distributions of the process $\xi(t)$ which satisfies Eq. (1). Further, a lemma is proved about the distributions of $w_n(t)$. There are 4 references: 3 Soviet-bloc and 1 non-Soviet-bloc (in translation).

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A limit theorem for ...

ASSOCIATION: Kyyivs'kyy derzhavnyy universytet (Kyyiv State University)

PRESENTED: by Academician B. V. Hnyedenko AS UkrRSR

SUBMITTED: November 26, 1961

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Card 5/5

SKOROKHOD, A. V. (Kiyev)

Additive functionals in the Brownian movement process. Teor. veroiat. i ee prim. 6 no.4:430-439 '61. (MIRA 14:11)
(Functional analysis)
(Brownian movements)

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16.6100

AUTHOR: Skorokhod, A. V.

TITLE: Some limit theorems for the additive functionals of a sequence of sums of independent random quantities

PERIODICAL: Ukrainskiy matematicheskiy zhurnal, v. 13, no. 4, 1961, 67 - 78

TEXT: Limiting distributions of the kind $\eta_n = \sum_{k=0}^{n-r} \Phi_n (S_{nk}, S_{nk+1}, \dots, S_{nk+r})$ (2) are examined. $\xi_1, \xi_2, \dots, \xi_n$ are independent, uniformly distributed random quantities, for which $M\xi_n = 0$, $D\xi_n = 1$ holds. $\Phi_n(x_0, x_1, \dots, x_r)$ is a sequence of measurable functions with $x_i \in (-\infty, \infty)$. Moreover, the relation $S_{no} = 0$, $S_{nk} = (1/\sqrt{n}) \sum_{i=1}^{k} \xi_i$ (1) is satisfied. If $\Phi_n (x_o, x_1, \dots, x_n) = (1/n) f(x_o, x_1, \dots, x_r)$ (where the function

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Some limit theorems for the ...

$f(x_0 x_1, \ldots, x_r)$ is continuous for $x_0 = x_1 = \ldots = x_r$), the limiting distribution of the quantities η_n existing in this case does not depend on the distribution of ξ_k and agrees with the distribution of the quantity $\int_0^1 f(w(t), w(t), \ldots, w(t))dt$ (3), where $w(t)$ denotes the Brownian movement. If $\Phi_n (x_0, x_1) = |\mathrm{sign}(x_0 - a) - \mathrm{sign}(x_1 - a)|/2\sqrt{n}$, the relation $\eta_n = \nu_n(a)/\sqrt{n}$ is satisfied, where $\nu_n(a)$ is the number of intersections of level a with the sequence of the sums S_{nk}, $k = 0, \ldots, n$. Pertinent previous papers by N. V. Smirnov (e. g., Priblizheniye zakonov raspredeleniya sluchaynykh velichin po empirichekim dannym, UMZh, 10, 1944, 179 - 206) and I. I. Gikhman, Visn. Kiivs'k un-ty, t. 16, v. 16; Matem. zb., No 10, 1957, 149 - 163, are mentioned. If the two conditions 1) $\Phi_n (x_0, x_1, \ldots, x_r) \geqslant 0$, and 2) $\lim_{n\to\infty} \sup_{x_0, x_1, \ldots x_r} \Phi_n(x_0, x_1, \ldots, x_r)$ X

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= 0 are satisfied, $\bar{\Phi}_n(x_o, x_1, \ldots, x_r)$ can be regarded as function of a single argument. Among others, the following theorems are proved: Theorem 1: If conditions 1) and 2) are satisfied, the quantity η_n which is defined by (2) does not have a limiting distribution unless $\bar{\eta}_n = \sum_{k=0}^{n} \bar{\bar{\Phi}}_n(S_{nk})$ (4) has one. $\bar{\Phi}_n(x_o) = \vec{M}\Phi_n(x_o, x_o+S_{n1}, \ldots, x_o+S_{nr})$ holds. The limiting distributions of the quantities η_n and $\bar{\eta}_n$ are in agreement if they do at all exist. Theorem 2: The relation $u_n(x) = 2n \int_0^x \bar{\bar{\Phi}}_n(z)dz$ is assumed to hold, and a function $u(x)$ is taken to be such that $u_n(x) \rightarrow u(x)$ for almost all x. If the quantities ξ_k have an integrable distribution density, a limiting distribution of the quantity $\bar{\eta}_n$ exists, which agrees with the distribution of the quantities $\int_0^{w(1)} u(x)dx - \int_0^1 u(w(s))dw(s)$, and there is a

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Some limit theorems for the ...

Gaussian process for which $\vec{M}\, w(t) = 0$, $\vec{M}\, w(t)w(s) = \min [t, s]$. The integral $\int_0^1 u(w(s))dw(s)$ is stochastic. Theorem 3: If, for $|x| > C$, $\bar{\Phi}(x) = 0$, and if the quantities ξ_n have an integrable density, $\sup \int_{-\infty}^{\infty} n\, \bar{\Phi}_n(x)dx < 0$ is a necessary condition for the existence of a limiting distribution of the quantity $\bar{\eta}_n$. Theorem 4 contains the necessary and sufficient conditions for the existence of a limiting distribution of the quantities $\bar{\eta}_n$. Theorem 5: If the measurable functions v(x) and u(x), defined for $x \in R^{(m)}$ do exist (v(x) is a numerical function, and u(x) is a function with values from $R^{(m)}$), so that $\lim_{n\to\infty} \int_{|x|\leqslant C} \left[(v(x) - v_n(x))^2 + |u(x) - u_n(x)|^2\right] dx/|x|^{m-2} = 0$, and if the quantities ξ_k have an integrable density, the quantity $\bar{\eta}_n$ defined by (4) will have a limiting distribution that agrees with the distribution of the quantity $v(w(1))) - v(w(0))$

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$-\int_0^1 (u(w(s))dw(s))$, where w(s) describes an m-dimensional Brownian movement. In addition, $\int_0^1 (u(w(s)), dw(s)) = \sum_{k=1}^{m} \int_0^1 u^k(w(s))dw^k(s)$ if u^k and w^k are the components of the vectors u and w in a certain orthonormal coordinate system in $R^{(m)}$. The limit distributions contemplated by the theorems 2 and 5 are distributions of non-negative homogeneous additive functionals of the Brownian movement, as have been studied also by V. A. Volkonskiy (Additivnyye funktsionaly ot markovskikh protsessov, DAN SSSR, 127, 1959, 735 - 738). There are 11 references: 8 Soviet and 3 non-Soviet. The three references to English-language publications read as follows: M. Donsker, An invariance principle for certain probability limit theorems, Mem. Am. Math. Soc., 6, 1951, 1 - 12; K. L. Chung, G. A. Hunt, On the zeros of $\sum_1^n \pm 1$, Ann. Math., 50, 1949, 385 - 400. K. L. Chung, Fluctuations of sums of independent random variables, Ann. Math., 51, 1950, 697 - 706.

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SKOROKHOD, A.V.

Transactions of the Sixth Conference (Cont.) SOV/6371

Transactions of the 6th Conf. on Probability Theory and Mathematical Statistics and of the Symposium on Distributions in Infinite-Dimensional Spaces held in Vil'nyus, 5-10 Sep '60. Vil'nyus Gospolitizdat Lit SSR, 1962. 493 p. 2500 copies printed

SKOROKHOD, A.V.

Transactions of the Sixth Conference (Cont.) SOV/6371

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AUTHOR: Skorokhod, A. V.

TITLE: Stochastic equations for diffusion processes in a bounded region. II.

PERIODICAL: Teoriya veroyatnostey i yeye primeneniye, v. 7, no. 1, 1962, 5-25

TEXT: The first part of the paper was published in the same periodical VI, 3, 1961. In the present second part the notations of the first part are used throughout. First of all four lemmata on the properties of the sequence η_k which is solution of (1.2) are proved; e. g. Lemma 1: If there exist constants A, B, C such that

$$|\sigma(t,x)| + |a(t,x)| \leq A+B|x|, \quad \mathsf{P}\{|h_k| \leq C\} = 1 \text{ for } k = 1,2,\dots,n$$

and $\mathsf{M}\eta_0^2 < \infty$, then there exists a constant H only depending on A, B, C, $T-t_0$ and $\mathsf{M}\eta_0^2$ such that $\mathsf{M}\eta_k^2 \leq H$ for $k = 0, 1, \dots, n$.

Adjoining one proves the existence of a process with a reflecting boundary by showing that one can construct the solution of the equation (5) as a sequence of solutions of (1.2). Then for a random process

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Stochastic equations for diffusion ...

$\eta(t)$ which is defined on $[t_0, T]$ and which is continuous with probability 1 the stochastic integral

$$\int_{t_0}^{T} c(t)\Psi_0(\eta(t))\sqrt{dt},$$ i. e.

$$\int_{t_0}^{T} c(t)\Psi_0(\eta(t))\sqrt{dt} = \lim_{\substack{\lambda \to 0 \\ \sup \nu < \infty}} \sum_{i=0}^{n-1} c(\bar{t}_i)\,\xi_i\sqrt{\Delta t_i} \qquad (1.15)$$

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is defined, where $c(t)$ is a function, defined on $[t_0, T]$,

$$\xi_i = \Psi_0\left(\inf_{t \in [t_i, t_{i+1}]} |\eta(t)|\right) \qquad (1.14)$$

and $\Psi_0(x) = 1$ for $x = 0$, $\Psi_0(x) = 0$ for $x \neq 0$; there is $\lambda = \max_k \Delta t_k$,

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Stochastic equations for diffusion ... S/052/62/007/001/001/005
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$$\mu = \max_{k,j} \frac{\Delta t_k}{\Delta t_j} .$$

By aid of this integral the following main result is proved:

Assume that for the coefficients $a(t,x)$ and $\sigma(t,x)$ the following conditions be satisfied:

1.) they are defined and continuous for $x \geq 0$, $t \in [t_0, T]$

2.) there exists a constant K such that for all $x \geq 0$, $\varphi \geq 0$ the inequality

$$|a(t,x) - a(t,y)| + |\sigma(t,x) - \sigma(t,y)| \leq K|x - y|$$

is satisfied.

3.) there exists a $\delta > 0$ such that for $t \in [t_0, T]$, $x \in [0, \delta]$ the partial derivatives $\frac{\partial \sigma(t,x)}{\partial t}$ and $\frac{\partial \sigma(t,x)}{\partial x}$ are defined and continuous, where for all $x \in [0, \delta]$ and $y \in [0, \delta]$ there is

$$\left|\frac{\partial \sigma}{\partial x}(t,x) - \frac{\partial \sigma}{\partial x}(t,y)\right| \leq K|x-y|$$

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X

4.) $\sigma(t, 0) >$ for $t \in [t_0, T]$. Further on η_0 shall not depend on $w(t) - w(t_0)$ for $t \in [t_0, T]$, and let $M\eta_0^2 < \infty$. X

Then there exists a unique Markov process $\eta(t)$ with the properties

I. $P\{\eta(t) \geq 0\} = 1$ for $t \in [t_0, T]$

II. $\eta(t)$ is continuous with probability 1

III. $\sup_t M\eta^2(t) < \infty$, satisfying the equation

$$\eta(t) = \eta_0 + \int_{t_0}^{t} a(s, \eta(s))\, ds + \int_{t_0}^{t} \sigma(s, \eta(s))\, dw(s) + \sqrt{\frac{\pi}{8}} \int_{t_0}^{t} \sigma(s, 0)\Psi_0(\eta(s))\sqrt{ds}.$$

SUBMITTED: September 15, 1959

SKOROKHOD, A.V.

PHASE I BOOK EXPLOITATION SOV/6255

Skorokhod, Anatoliy Vladimirovich

Issledovaniya po teorii sluchaynykh protsessov; stokhasticheskiye differentsial'nyye uravneniya i predel'nyye teoremy dlya protsessov Markova (Investigations in the Theory of Random Processes; Stochastic Differential Equations and Limit Theorems for Markov Processes) Kiyev, Izd-vo Kiyev. Univ., 1961. 215 p. 5000 copies printed.

Sponsoring Agency: Ministerstvo vysshego i srednego spetsial'nogo obrazovaniya UkrSSR. Kiyevskiy ordena Lenina gosudarstvennyy universitet imeni G. G. Shevchenko.

Resp. Ed.: I. I. Gikhman, Doctor of Physical and Mathematical Sciences, Professor; Ed.: Ye. V. Mironets; Tech. Ed.: T. I. Khokhanovskaya.

PURPOSE: This book is intended for students, aspirants, and scientists working in the field of probability theory and those branches of physics and engineering where probability methods are used.

Card ~~1/7~~
1/2

MIKHKIYEV, A.; SKOROKHOD, A.V., kand. biologicheskikh nauk, nauchnyy rukovoditel'

Agrochemical characteristics of peat-manure composts and their effect on the potato yield. Sbor. nauch. rab. stud. Petrozav. gos. un. no.6:151-162 '62. (MIRA 17:11)

1. Kafedra pochvovedeniya Petrozavodskogo gosudarstvennogo universiteta.

S/052/63/008/001/004/005
B112/B186

AUTHOR: Skorokhod, A. V. (Kiyev)

TITLE: A limit theorem for homogeneous Markov chains

PERIODICAL: Teoriya veroyatnostey i yeye primeneniya, v. 8, no. 1, 1963, 67 - 75

TEXT: A sequence of homogeneous Markov chains $\xi_0^{(n)}, \xi_1^{(n)}, \ldots, \xi_n^{(n)}$ is considered for which

$$\int (y-x) P_n(x, dy) = \frac{a(x)}{n} + O\left(\frac{1}{n^{3/2}}\right), \quad (1)$$

$$\int (y-x)^2 P_n(x, dy) = \frac{\sigma^2(x)}{n} + O\left(\frac{1}{n^{3/2}}\right) \quad (2)$$

$$P\left\{|\xi_i^{(n)} - \xi_{i-1}^{(n)}| > \frac{c}{\sqrt{n}}\right\} = 0.$$

If $g_1(t) < g_2(t)$ and $\sup\limits_{t \geq 0} (g_1'(t)^2 + g_2'(t)^2) < \infty$, then the sequence

$$Q_n = P\left\{g_1\left(\frac{k}{n}\right) < \xi_k^{(n)} < g_2\left(\frac{k}{n}\right);\; k=0, 1, \ldots, n\right\}. \quad (3)$$

will converge towards

$$Q = P(g_1(t) < \xi(t) < g_2(t);\; 0 < t < 1). \quad (4)$$

The following theorem is derived: if a'_x, σ'_x, σ''_{xx} are bounded and continuous, if $\sigma(x) > 0$, and if

$$\xi(t) = \xi_0^{(n)} + \int_0^t a(\xi(s))\, ds + \int_0^t \sigma(\xi(s))\, dw(s), \quad (5)$$

where $w(t)$ is independent of $\xi_0^{(n)}$, then there will exist such a number L that

$$|Q_n - Q| \leq L \log n / \sqrt{n}.$$

SUBMITTED: October 26, 1960

SKOROKHOD, A.V. (Kiyev)

Homogeneous continuous Markov processes that are martingales.
Teor. veroiat. i ee prim. 8 no.4:379-390 '63. (MIRA 17:1)

SKOROKHOD, A.V.

Multiplicative uniformly continuous families of random stochastic operators. Dokl. AN SSSR 159 no.2:283-285 N '64. (MIRA 17:12)

1. Kiyevskiy gosudarstvennyy universitet. Predstavleno akademikom A.N. Kolmogorovym.

L 40800-65 EWT(1)
ACCESSION NR: AP4045050 S/0052/64/009/003/0492/0497

6
B

AUTHOR: Skorokhod, A. V. (Kiev)

TITLE: Branching diffusion processes

SOURCE: Teoriya veroyatnostey i yeye primeneniya, v. 9, no. 3, 1964, 492-497

TOPIC TAGS: branching diffusion process, Markov branching process, diffusion process

ABSTRACT: The author obtains equations for the transition probabilities of branching diffusion processes for one single type of particle. Similar processes for several types of particles were previously investigated by B. A. Sevast'yanov (Degeneration Conditions for branching processes with diffusion, teoriya veroyatn. i eye primen. VI, 3 (1961), 276-286). Orig. art. has: 7 equations

ASSOCIATION: None

SUBMITTED: 19Dec63 ENCL: 00 SUB CODE: NP

NR REF SOV: 003 OTHER: 000

Card 1/1

L 36969-65 EWT(d) IJP(c)
ACCESSION NR: AP5000566 S/0052/64/009/004/0644/0654

9
B

AUTHOR: Skorokhod, A. V. (Kiev)

TITLE: Boundary Conditions for Certain Markov Processes

SOURCE: Teoriya veroyatnostey i yeye primeneniya, v. 9, no. 4, 1964, 644-654

TOPIC TAGS: Markov process, 16 probability theory, Martin boundary, homogeneous Markov process

ABSTRACT: The author defines a boundary for a Markov process taking values in the union of a locally compact topological space and the set of points at infinity. The boundary is related to the harmonic functions of the process and it is proved that all functions belonging to the domain of the infinitesimal operator satisfy a particular boundary condition. It turns out that this condition and the characteristic operator of the process determine the process completely. "I would like to thank Ye. B. Dy*nkin and the members of a seminar he supervised for useful discussions." Orig. art has: 7 equations.

Card 1/2

L 45808-65 EWT(d) IJP(c)
ACCESSION NR AM4043736

BOOK EXPLOITATION

S/
10
B+1

Skorokhod, Anatoliy Vladimirovich

Processes with independent random variables 16 (Sluchaynyye protsessy s nezavisimymi prirashcheniyami), Moscow, Izd-vo "Nauka", 1964, 278 p. biblio. 9,000 copies printed. Series note: Teoriya veroyatnostey i matematicheskaya statistika

TOPIC TAGS: mathematics, random process theory, independent random variable, Brownian movement

PURPOSE AND COVERAGE: This book is devoted to the theory of random processes with independent variables--one of the most important parts of random process theory. In this book, for the first time, are collected the many important results obtained in the study of random processes with independent variables. These results had been scattered among various articles. The book is of interest for specialists in probability theory working on random processes and for those who study random process theory and are concerned with its application in various branches of science.

Card 1/3

L 45808-65

ACCESSION NR AM4043736

0

TABLE OF CONTENTS [abridged]:

Card 2/3

L 45803-65
ACCESSION NR AM4043736

0

SUBMITTED: 06Feb64

SUB CODE: MA

NO REF SOV: 021

OTHER: 060

Card 3/3

L 31771-66 EWT(d)/EWP(l) IJP(c)

ACC NR: AT6007535 SOURCE CODE: UR/0406/65/001/002/0101/0107

AUTHOR: Skorokhod, A.V.

38
B

ORG: none

TITLE: Quantity of information encoded by a nonlinear channel with internal noise

SOURCE: Problemy peredachi informatsii, v. 1, no. 2, 1965, 101-107

TOPIC TAGS: encoding theory, Gaussian distribution

ABSTRACT: The author considers a random signal x(t) which passes through a channel yealding a signal y(t) related to x(t) by a differential equation

$$y^{(n)}(t) + f_1(y, y', \ldots, y^{(n-1)}) + f_2(y, y', \ldots, y^{(n-1)})\alpha(t) = x(t),$$

which depends on the internal noise of the system and is assumed to be a Gaussian process. Let $I_T(x,y)$ denote the quantity of information in the process. The author introduces functions v(t) and ζ(t) and derives the equation

$$I_T(x, y) = \frac{1}{2} M \int_0^T \left(\frac{v(s)}{\zeta(s)}\right)^2 ds.$$

Let x(t) be a Gaussian process where $Mx(t) = a(t)$, $Mx(t)x(s) = R(t, s) + a(t)a(s)$. Then, $v(t)/\zeta(t) = d(t, t)/f_2(t)$, where d(t,s) for $0 < s < t$ satisfies the differential equation

$$d(t, s) + \int_0^t R(s, u) \frac{1}{f_2(u)^2} d(t, u)\,du = x(s) - a(s) - \int_0^t \frac{R(s,u)}{f_2(u)} dw(u);$$

Card 1/2 UDC: 621.391.12

L 31971-66

ACC NR: AP6007535

Hence, $I_T(x, y) = \frac{1}{2} M \int_0^T d(t, t)^2 dt$ The proof is based on a combinatorial lemma.

The author then considers several special cases where R satisfies additional hypotheses and derives equations for $d(t,t)$ and $I_T(x,y)$, which throw some light on the general case. Orig. art. has: 13 formulas.

SUB CODE: 12,09/ SUBM DATE: 16Nov64/ ORIG REF: 002/ OTH REF: 001

Card 2/2

SKOROKHOD, A.V. (Kiyev); SLOBODENYUK, N.P. (Kiyev)

Limiting distribution for additive functionals of a sequence of sums of independent equally distributed latticed random variables. Ukr. mat. zhur. 17 no.2:97-105 '65. (MIRA 18:5)

SKOROKHOD, A.V.

Constructive methods for the representation of random processes.
Usp. mat. nauk 20 no.3:67-87 My-Je '65.

(MIRA 18:6)

GIKHMAN, Iosif Il'ich; SKOROKHOD, Anatoliy Vladimirovich; DONCHENKO, V.V., red.

[Introduction to the theory of random processes] Vvedenie v teorii sluchainykh protsessov. Moskva, Nauka, 1965. 654 p. (MIRA 18:10)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001651110018-7"

PROKHOROV, A.V.

Absolute continuity of infinitely divisible distributions of mean values. Teor. veroiat. i ee prim. 10 no.3:516-518 '65. (MIRA 18:9)

APPROVED FOR RELEASE: 07/13/2001 CIA-RDP86-00513R001651110018-7"

L 8931-66 EWT(d)/T IJP(c)

ACC NR: AP5028004 SOURCE CODE: UR/0052/65/010/004/0660/0671

44,55

AUTHOR: Skorokhod, A. V.; Slobodenyuk, N. P.

44,55

26

B

ORG: None

TITLE: Limit theorems for random walks. Part 1.

SOURCE: Teoriya veroyatnostey i yeye primeneniya, v. 10, no. 4, 1965, 660-671

16,44,55

TOPIC TAGS: distribution theory, random walk problem, distribution function, existence theorem

ABSTRACT: An investigation is made of the sequence of independent, indentically distributed random variables $\xi_1, \xi_2, \ldots, \xi_n, \ldots$, $M\xi_i = 0$, $D\xi_i = 1$. It is assumed that $S_k = \sum_1^k \xi_i$.

This article studies the limit distributions of the normalized sums $\eta_n = \sum_{k=1}^{n} f(S_k)$, where f(x) is a measurable function. Specifically, the authors study the problem of the existence of constants A_n and B_n such that the distribution of the variable $(\eta_n - A_n)/B_n$ converged at $\infty \leftarrow u$ to some nondegenerate distribution. Orig. art. has: 68 formulas.

SUB CODE: MA / SUBM DATE: 22Mar65 / ORIG REF: 005 / OTH REF: 007

90

Card 1/1

2

SKOROKHOD, A.V. (Kiyev)

Absolute continuity of a family of measures depending on the parameter. Ukr. mat. zhur. 17 no.5:129-135 '65. (MIRA 18:12)

1. Submitted February 26, 1965.

L 23286-66 EWT(d) IJP(c)

ACC NR: AP6011286 SOURCE CODE: UR/0378/66/000/001/0034/0040

17

(1)

AUTHOR: Skorokhod, A. V.

ORG: none

16 44,55

TITLE: Nonlinear transformation of random processes

SOURCE: Kibernetika, no. 1, 1966, 34-40

TOPIC TAGS: random process, nonlinear transformation, Markov process transformation

ABSTRACT: Some general methods for studying nonlinear transformations of random processes are analyzed under the assumption that complete information concerning the input process is known. The following three ways of defining complete information concerning a random process are utilized: 1) finite-dimensional distributions of the random process are given; 2) the characteristic functions of the process is given; 3) the measure density corresponding to the process is given. The following four transformations (important in applications) were applied: 1) inertia-free transformation, 2) integral transformation, 3) differential transformation, and 4) inverse differential (integral) transformation. In the first place, the transformation of homogeneous Markov processes defined by means of an infinitesimal operator was considered. Inertia-free and integral transformations were used and the functional characteristics of the output process were established. In the

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UDC: 519.27

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L 23286-66
ACC NR: AP6011286

second place, transformation of processes defined by means of the characteristic functional was considered. Differential and integral transformations were applied. In both cases, determining the characteristics of the output process is reduced to the solution of equations containing partial or variational derivatives. Under quite general assumptions concerning the input process and the transformation, the measure density corresponding to the output process in terms of the measure density corresponding the input process is established. The problem of constructing the orthogonal system of functionals for measures in functional spaces in analyzed. [LK]
Orig. art. has: 10 formulas.

SUB CODE: 12/ SUBM DATE: 02Nov65/ ORIG REF: 007/ OTH REF: 002/ ATD PRESS: 4235

Card 2/2

L 45156-66 EWT(1)

ACC NR: AP6021952 SOURCE CODE: UR/0052/66/011/001/0056/0067

27
B

AUTHORS: Skorokhod, A. V. (Kiev); Slobodenyuk, N. P. (Kiev)

ORG: none

TITLE: Limit theorems for random walks. 2

SOURCE: Teoriya veroyatnostey i yeye primeneniya, v. 11, no. 1, 1966, 56-67

TOPIC TAGS: boundary value problem, random walk problem, probability, functional equation, Gaussian distribution, Laplace transform, normal distribution

ABSTRACT: This paper is a continuation of work published earlier (A. V. Skorokhod and N. P. Slobodenyuk, Teoriya veroyat. i yeye primen., X, No. 4, 1965, p. 660). The definitions are not repeated. The limit distributions of the values η_n in the general case ($A_n \neq 0$) are studied. In the absolutely continuous case,

$$u_n(x) = \frac{2\sqrt{n}}{B_n}\int_0^{x\sqrt{n}} f(y)\,dy - \frac{2na_n x}{B_n},$$

$$g_n(x) = \frac{2\sqrt{n}}{B_n^2}\int_0^{x\sqrt{n}} f^2(y)\,dy - \frac{2a_n}{B_n}u_n(x) - \frac{2na_n^2 x}{B_n^2}.$$

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L 45156-66
ACC NR: AP6021952

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In the lattice case,

$$u_n(x) = \frac{2\sqrt{n}}{B_n}\operatorname{sign} x \sum_{\frac{\sqrt{n}}{2}(x-|x|)<k\leq\frac{\sqrt{n}}{2}(x+|x|)} f(k) - \frac{2a_n\sqrt{n}}{B_n}[x\sqrt{n}],$$

$$g_n(x) = \frac{2\sqrt{n}}{B_n^2}\operatorname{sign} x \sum_{\frac{\sqrt{n}}{2}(x-|x|)<k\leq\frac{\sqrt{n}}{2}(x+|x|)} f^2(k) - \frac{2a_n}{B_n}u_n(x) - \frac{2\sqrt{n}\,a_n^2}{B_n^2}[x\sqrt{n}].$$

Two lemmas and five theorems are introduced. Some methods by which the distributions of the functionals of a process w(t) can be found are examined:

$$\eta = \int_0^{w(1)} u(s)\,ds - \int_0^1 u(w(s))\,dw(s),$$

where u(s) is the function to be measured. It is found that

$$P\{\eta_{0,1,-1} < x\} = \begin{cases} \sqrt{\frac{2}{\pi}}\int_0^x e^{-z^2/2}\,dz, & x \geq 0, \\ 0 & x \leq 0 \end{cases}$$

and

$$M\exp\left\{i\lambda\int_0^1 w^2(t)\,dt\right\} = \prod_{k=1}^{\infty} M\exp\{i\lambda\zeta_k^2\} =$$

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ACC NR: AP6021952

$$=\prod_{k=1}^{\infty}\frac{1}{\sqrt{2\pi}\,\sigma_k}\int_{-\infty}^{\infty}\exp\left\{-\frac{(1-2i\lambda\sigma_k^2)x^2}{2\sigma_k^2}\right\}dx=\prod_{k=1}^{\infty}(1-2i\lambda\sigma_k^2)^{-1/2}=$$

$$=\prod_{k=1}^{\infty}\left(1-\frac{8i\lambda}{(2k+1)^2\pi^2}\right)^{-1/2}=(\cos\sqrt{2i\lambda})^{-1/2}.$$

Orig. art. has: 24 formulas.

SUB CODE: 12/ SUBM DATE: 22Mar65/ ORIG REF: 003/ OTH REF: 002

Card 3/3 ant

L 01280-67 EWT(d) IJP(c)

ACC NR: AP6030787 SOURCE CODE: UR/0052/66/011/003/0381/0423

AUTHOR: Skorokhod, A. V. (Kiev)

ORG: none

TITLE: Local structure of continuous Markov processes

32
B

SOURCE: Teoriya veroyatnostey i yeye primeneniya, v. 11, no. 3, 1966, 381-423

TOPIC TAGS: Markov process, function analysis, continuous Markov process

ABSTRACT: A study has been made of the local structure of continuous Markov processes, and the following result is proved. Let x_t be a continuous Markov process in a locally compact space X. There exists an additional positive function φ_t such that the process $y_t = x_{\tau_t}$, where τ_t is determined by the equality $\varphi_{\tau_t} = \tau$, possesses a property so that if $F(\xi_1, \ldots, \xi_k)$ is a continuous bounded function which has derivatives of the first and the second orders and $\varphi_1, \ldots, \varphi_k$ belong to the domain of the process y_t, then

$$M_y F(\varphi_1(y_t), \ldots, \varphi_k(y_t)) - F(\varphi_1(y), \ldots, \varphi_k(y)) = \int_0^t M\psi(y_s)\,ds,$$

$$\psi(y) = \sum a_i(y) \frac{\partial F}{\partial \xi_i}(\varphi_1(y), \ldots, \varphi_k(y)) + \frac{1}{2} \sum b_{ij}(y) \frac{\partial^2 F}{\partial \xi_i \partial \xi_j}(\varphi_1(y), \ldots, \varphi_k(y)),$$

Card 1/2

L 05387-67 EWT(1)/EWP(c) IJP(c)

ACC NR: AP6024531 SOURCE CODE: UR/0041/66/018/004/0060/0071

28
B

AUTHOR: Skorokhod, A. V. (Kiev); Slovodenyuk, N. P. (Kiev)

ORG: none

TITLE: On the asymptotic behavior of several functionals of the Brownian movement process

SOURCE: Ukrainskiy matematicheskiy zhurnal, v. 18, no. 4, 1966, 60-71

TOPIC TAGS: Brownian motion, ~~mechanics~~, random process, asymptotic stability, ASYMPTOTIC PROPERTY

ABSTRACT: If $w(t)$, $0 < t < +\infty$, is an m-dimensional Brownian process, i. e., $w(t) = (w^{(1)}(t),\ldots,w^{(m)}(t))$, where $w^{(i)}(t)$ are independent one-dimensional Brownian movements, and $f(x)$ is a Borel function integrable in each measurable set $R^{(m)}$, the following quantity is studied

$$\eta_T = \int_0^T f(w(t))\,dt = \int_0^T f(w^{(1)}(t), \ldots, w^{(m)}(t))\,dt.$$

to determine its limiting distributions when $T \to \infty$. In particular, constants B_T are sought such that the distribution of the quantity η_T/B_T converges when $T \to \infty$ to a

Card 1/2

Skorokhod, A.V.

USSR.

√The chemical nature of humic acids isolated from soil by various methods. M. D. Kydalevskaya and A. V. Skorok-hod. Uchenye Zapiski Leningrad. Gosudarst. Univ. im. A.A. Zhdanova No. 140 Ser. Biol. Nauk No 27, 18-29 (1951).—R. and S. compare various chem. methods for isolating humic acids (I) with neutral and alk. solvents successively, with and without decalcification by H_2SO_4. The neutral solvent (1% NaF) dissolves from 0% of I in terra rosa to 68% of I in humus-illuvial soils; 0.1*N* NaOH exts. the remainder of the I. Total extn. of I by this method equals that by extn. with NaOH after decalcification. N content of I extd. by NaF is the lowest, and in the fraction subsequently extd. with NaOH the N content is the highest. The elementary compn. of I is otherwise the same (not different compds. as previously believed). Hydrolysis with 25% HCl brings the N of the 2 fractions down to nearly the same level. The exchange absorption capacity (II) is highest in the NaF fraction and lowest in the subsequent NaOH fraction, and hydrolysis with 2% HCl does not change II. R. and S. believe that the N-contg. substances are not part of the I mol. but are protein in nature. N content for humus contg. I is the same as for I. The difference in II is believed to be the result of differences in dispersion. Fractions isolated by alkali after NaF have a lowered carboxyl content. A. W. Daly

RYDALEVSKAYA, M.D., SKOROKHOD, A. V.

Humic Acid

Chemical nature of humic acids isolated from soils by various methods. Uch.zap.Len.un., No. 140, 1951.

Monthly List of Russian Accessions, Library of Congress, June 1952. Unclassified.

SKOROKHOD, A. V.

SKOROKHOD, A. V.: "Aspects of humus formation in soils on carbonate rock in the podzolic and forest-steppe zones". Leningrad, 1955. Leningrad Order of Lenin State U imeni A. A. Zhdanov. (Dissertations for the Degree of Candidate of Biological Science)

SO: Knizhnaya letopis', No. 52, 24 December, 1955. Moscow.

ACCESSION NR: AP4024998 S/0070/64/009/002/0284/0287

AUTHORS: Datsenko, L. I.; Skorokhod, M. Ya.

TITLE: Application of crystal scanning for anomalous passage of x-rays

SOURCE: Kristallografiya, v. 9, no. 2, 1964, 284-287

TOPIC TAGS: crystal scanning, x ray, dislocation, germanium, silicon, single crystal, anomalous x ray transmission, transmitted ray, reflected ray

ABSTRACT: The authors' purpose has been to find a better method of studying defects in crystals. The technique they have employed entails the transmission of x-rays in crystals fulfilling Wulff-Bragg conditions, such that the x-rays on transmission are split into two interference rays: one transmitted, one reflected, the transmitted ray traveling straight through and emerging in a direction the same as the incident ray, the reflected ray emerging at some angle to this. The crystal is rotated during measurement, and a diaphragm cuts out the direct transmitted ray but allows the reflected wave to fall on a photographic plate. The area of a single crystal that may be photographed in a stationary position is determined by the focal length of the spots and by the divergence of the x-rays.

ACCESSION NR: AP4024998

The minimal distance between crystal and photographic plate produces maximal resolution of the dislocation image. The application of crystal scanning by means of anomalous transmission of x-rays permits one to obtain a clear image of dislocations in monocrystalline Ge and Si. The authors observed a noticeable expansion of the image of defects during scanning as compared with images of the same defects in the stationary position. In using this method one finds less rigid requirements in the precision of preparing the scanning mechanism and of adjusting the crystal than is required by the method of A. R. Lang (J. Appl. Phys., 30, 1748-1755, 1959; Acta crystallogr., 12, 249-250, 1959). "In conclusion, the authors express their thanks to A. M. Yelistratov and V. F. Miuskov for their valuable counsel and remarks." Orig. art. has: 3 figures and 2 formulas.

ASSOCIATION: Institut poluprovodnikov AN USSR (Institute of Semiconductors AN UkrSSR)

SUBMITTED: 08May63 DATE ACQ: 16Apr64 ENCL: 00

SUB CODE: PH NO REF SOV: 002 OTHER: 004

Card 2/2

L 34097-66 EWT(m)/T/EWP(t)/ETI IJP(c) JD/JW/JG/GD

ACC NR: AT6013833 SOURCE CODE: UR/0000/65/000/000/0099/0109

52
B+1

AUTHOR: Kopan', V. S.; Skorokhod, M. Ya.

ORG: Kiev State University im. T. G. Shevchenko (Kiyevskiy gosudarstvennyy universitet)

TITLE: Kinetics of annealing of vacancies in platinum

SOURCE: AN UkrSSR. Issledovaniye nesovershenstv kristallicheskogo stroyeniya (Study of imperfections in crystal structure). Kiev, Naukova dumka, 1965, 99-109

TOPIC TAGS: platinum, activation energy, crystal vacancy, thermoelectromotive force, BOND ENERGY, ANNEALING, WIRE

ABSTRACT: The aim of the study was to obtain experimental values of the bonding energy of bivacancies in platinum, and, by using the theory advanced by M. de Jong and J. S. Koehler (Phys. Rev. 129, 40-61, 1963), to correlate the data already obtained. The annealing of vacancies was studied on platinum wires (99.98%) 100 mμ in diameter by measuring the thermo-emf of a thermocouple made up of a quenched and an annealed specimen. E_m^1, the activation energy of motion of vacancies, was found to be 20.7×10^{-18}J, and B_2, the energy of formation of bivacancies, 3×10^{-18}J. The theoretical dependence of E_m, the activation energy of the annealing process, on the concentration of defects was confirmed experimentally: the authors' hypothesis that the limit toward which

Card 1/2

VITRIKHOVSKIY, N.I.; DATSENKO, L.I.; SKOROKHOD, M.Ya.

Structure defects in CdS single crystals. Fiz. tver. tela 7 no.3:870-876 Mr '65. (MIRA 18:4)

1. Institut poluprovodnikov AN UkrSSR, Kiyev.

L 49041-65 EEC(b)-2/EWA(c)/EWT(l)/EWT(m)/EWP(b)/T/EWP(t) Pu-4 IJP(c) GG/
JD

ACCESSION NR: AP5006897 S/0181/65/007/003/0870/0876

AUTHOR: Vitrikhovskiy, N. I.; Datsenko, L. I.; Skorokhod, M. Ya.

TITLE: Investigation of imperfections in the structure of CdS single crystals

SOURCE: Fizika tverdogo tela, v. 7, no. 3, 1965, 870-876

TOPIC TAGS: cadmium sulfide, structural imperfection, x ray diffraction, single crystal growth

ABSTRACT: It is pointed out in the introduction that earlier investigations of imperfections in these crystals were based predominantly on metallographic methods and can therefore not give all the required information. The authors therefore attempted to study the real structure of CdS single crystals obtained by synthesis and sublimation from the vapor phase using an etchant and an x-ray diffraction method specially developed for the purpose. The liquid etchant consisted of 20% hydrochloric acid and zinc chloride. The x-ray method was based on the use of anomalous transmission of x-rays and photographing the crystal defects by means of the reflected beam. A special crystal holder made it possible to rotate the crystals in the vertical plane. The tests have disclosed the presence of two types of dis-

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L 49041-65

ACCESSION NR: AP5006897

locations with different Burgers vectors, parallel to the c-axis of the crystal (predominantly dislocations perpendicular to the crystal surface) and lying in the basal plane (dislocations parallel to the surface of the crystal). The tests have shown that the dislocations emerging to the surface of the crystal produce black-white contrast at the point of emergence, which is reversed when the inverted reflection ($hk\ell$) is used. Dislocations lying parallel to the surface of the crystal are represented within the crystal by black lines. The proposed new selective etchant for displaying the dislocations on the ($10\bar{1}0$) and (0001) planes yielded good agreement with the results of metallographic methods, in the case of single crystals with ($10\bar{1}0$) surface. "The authors thank Academician V. Ye. Lashkarev of AN UkrSSR for interest in the work and A. M. Yelistratov for valuable advice." Orig. art. has: 4 figures.

ASSOCIATION: Institut poluprovodnikov AN UkrSSR, Kiev (Institute of Semiconductors)

SUBMITTED: 03Aug64 ENCL: 00 SUB CODE: SS

NR REF SOV: 005 OTHER: 006

Card 2/2 ac

L 26755-66 EWT(m)/T/EWP(t) IJP(c) JD

ACC NR: AP6011472 SOURCE CODE: UR/0070/66/011/002/0300/0304

AUTHOR: Skorokhod, M. Ya.; Datsenko, L. I. 54

ORG: Institute of Semiconductors, AN UkrSSR, Kiev (Institut poluprovodnikov, AN UkrSSR) 50

TITLE: Structural defects arising during the growth and heat treatment of CdS single crystals 18 B

SOURCE: Kristallografiya, v. 11, no. 2, 1966, 300-304 18 27 27

TOPIC TAGS: cadmium sulfide, single crystal growing, crystal defect, surface property, stoichiometry, crystal lattice dislocation, x ray diffraction analysis, crystal structure analysis

ABSTRACT: The authors have investigated the surface defects which are produced on single crystals of CdS when stoichiometry is violated, when impurities are segregated during the growth of the crystals, and also resulting from stacking faults and dislocations. The single crystals were grown by sublimation from the gas phase in the form of platelets with mirror surfaces and a small number of edges oriented predominantly along the c axis. The structure defects were detected by anomalous passage of x-rays in the μt interval from 2 to 27 (μ--linear coefficient of absorption of x-rays, t-- thickness of the crystal). The investigation was made with URS-251 apparatus using both white and monochromatic copper K_α radiation. In addition to x-ray diffraction, a metallographic method was also used to identify the defects unambiguously. An attempt was made to determine uniquely the appearance of segregations

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L 26755-66

ACC NR: AP6011472

4

of impurities and dislocations perpendicular to the surface. The observations disclosed stacking faults, helicoidal dislocations, dislocations with Burgers vector along the c axis, and also dislocations whose Burgers vectors lay in the basal plane. Most structure defects occuring in the thin crystals were dislocations with Burgers vector along the c axis and perpendicular to the surface of the crystal. In addition, the structure defects of certain single crystals heated to 700C in a nitrogen atmosphere with subsequent quenching was also investigated. In such crystals a stressed surface layer was produced, due to violation of the stoichiometric composition. The main lattice damage produced by heat treatment is localized in the surface layer of the crystal. The results demonstrate the possibility of investigating structure defects by means of a simple x-ray procedure. Dislocations parallel to the surface were also observed. The authors thank A. M. Yelistratov, Ye. G. Nikolayeva, V. N. Vasilevskaya, and N. Korsunskaya for advice and help with the heat treatment. Orig. art. has: 4 figures.

SUB CODE: 20/ SUBM DATE: 31Jan65/ ORIG REF: 002/ OTH REF: 008

Card 2/2

L 23003-66 EWT(m)/T/EWP(t) IJP(c) JD/JG

ACC NR: AP6009653 SOURCE CODE: UR/0181/66/008/003/0740/0743

AUTHORS: Skorokhod, M. Ya.; Datsenko, L. I.; Tkalenko, A. D. 45 44

ORG: Institute of Semiconductors, AN UkrSSR, Kiev (Institut poluprovodnikov AN UkrSSR) B

TITLE: X-ray diffraction study of dislocations in single crystals of InSb and GaAs 18

SOURCE: Fizika tverdogo tela, v. 8, no. 3, 1966, 740-743

TOPIC TAGS: x ray diffraction analysis, single crystal, crystal dislocation, indium compound, gallium arsenide

ABSTRACT: The purpose of the investigation was to check on the reliability of metallographic data on dislocation density in the investigated substances. To this end, the dislocation structure of single-crystal plates with surface parallel to (111) were cut from an ingot, the strained surface layer removed by etching, and the samples studied metallographically (MIM-7 microscopes) and by x-ray diffraction in copper K_α radiation using a procedure described by R. L. 2

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ACC NR: AP6009653

Petrusevich and Ye. S. Sollertinskaya (Kristallografiya v. 9, 722, 1964). The results have shown that the single-crystal structure defects can be measured by anomalous passage of x-rays, since the dislocation densities obtained by the metallographic and x-ray methods were 2.3×10^3 and 2.9×10^3 cm^{-2} for InSb and 2.3×10^3 and 7.2×10^3 cm^{-2} for GaAs. This also indicates that the investigated crystals had a near-perfect structure. In addition to linear dislocations, in the case of GaAs there were observed several dislocation loops which lie in one plane parallel to (111). It is deduced from this that the contrast of the dislocation image is determined not only by the orientation of the Burgers vector, but also by the disposition of the dislocation line relative to the diffraction plane, since different sections of the same loop had different contrasts in spite of the same direction of the Burgers vector. The authors thank A. M. Yelistratov for valuable advice and remarks. Orig. art. has: 2 figures.

SUB CODE: 20/ SUBM DATE: 17Jul65/ ORIG REF: 005/ OTH REF: 005

Card 2/2 *pla*

SKOROKHOD, Anatoliy Vladimirovich; DONCHENKO, V.V., red.

[Random processes with independent increments] Sluchainye protsessy s nezavisimymi prirashcheniiami. Moskva, Izd-vo "Nauka," 1964. 278 p. (MIRA 17:6)

27630
S/194/61/000/002/005/039
D216/D302

1.8000

AUTHORS: Goldovskiy, M.L. and Skorokhod, B.A.

TITLE: Construction of a thickness gauge with inductive pick-up which may also be used as a coreless defect analyzer

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 2, 1961, 21, abstract 2 A150 (Tr. in-ta fiz. metallov AN SSSR, 1959, no. 21, 139-141)

TEXT: A description is given of the electric circuit of an instrument for measuring non-metallic coatings of ferrous and non-ferrous metals and also the thickness of a homogeneous layer of metal. The pick-up is a flat single-layer winding coil 5 mm in diameter, wound in an Archimedes spiral from copper wire. The coil is fixed onto one end of a cylindrical former of insulating material. The pick-up coil makes the inductance of the grid circuit of a single valve 2 mc/s oscillator. The reading instrument is a wide-scale micro-

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Construction of a thickness gauge...

ammeter. The specification of all circuit components is given. 2 figures. 1 reference.

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L 24122-65
EWG(v)/EWT(l)/EWT(m)/EWP(b)/EWP(e) Pe-5/Po-4/Pq-4/Pac-4/Pae-2 WH/GW
ACCESSION NR: AP4043458 S/0115/64/000/007/0030/0031

AUTHOR: Skorokhod, B. A. 33 B

TITLE: Device for correcting and determining errors of a quartz clock by exact-time signals 15

SOURCE: Izmeritel'naya tekhnika, no. 7, 1964, 30-31

TOPIC TAGS: quartz clock, exact time radio signal, quartz clock correction

ABSTRACT: A portable quartz clock with an automatic device for correcting and determining error by exact-time radio signals invented by the author is briefly described. A block diagram of the clock and a simplified connection diagram of the pulse shaper are supplied. The error of the automatic correction device, operating on ROR and RES radio-station time signals, was under 1 millisec. Orig. art. has: 2 figures.

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00 SUB CODE: EC, IE
NO REF SOV: 001 OTHER: 000

Card 1/1

5.1500
5.1310
~~5(4), 5(2)~~

67793
S/064/59/000/07/029/035
B005/B012

AUTHORS: Skorokhod, G. A., Nekrashevich, I. Ye.

TITLE: Use of a Graphite Electrode for Measuring the Redox Potential

PERIODICAL: Khimicheskaya promyshlennost', 1959, Nr 7, p 639 (USSR)

ABSTRACT: The final "dechlorination" of the anolyte in the shops for the mercury electrolysis of aqueous common salt solutions is carried out in an alkaline medium by means of a sodium sulfide solution. A manual control does not guarantee an exact dosing of the sodium sulfide solution. For this reason the automation of this part of the mercury electrolysis is particularly important. The authors used the change in the redox potential of the system as the indicator in controlling the "dechlorination". In measuring this change it is especially difficult to find a suitable indicator electrode, which has to give - together with the auxiliary electrode - reproducible values of the electromotive force under various conditions. Furthermore, the electrode has to be resistant to the action of noxious impurities, and sufficiently sensitive to changes of the redox potential of the system. Experience has shown that platinum

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Use of a Graphite Electrode for Measuring the Redox Potential

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is not suited for use as electrode material. As the result of a thorough study of relevant publications the authors of the present paper selected graphite as the electrode material. Common graphite yields correct results, but on account of its porosity the potential adjusts itself very slowly and only after the electrode has been washed out carefully. In order to reduce porosity, graphite was impregnated with bakelite lacquer which was subsequently polymerized at 130°. At the same time, "igurite" and ATM-1 electrodes were tested. A saturated calomel electrode served as the auxiliary electrode. The electrodes of all three materials investigated yielded very similar values of the electromotive force, the potential adjusted itself almost instantly. By laboratory experiments as well as extensive use in the shops the above indicator electrodes have been shown to have a very long life. The use of the graphite electrode guarantees a reliable dosing of the sodium sulfide solution. A figure shows the excess of sodium sulfide in the anolyte by way of a diagram recorded by an autographic EPD-32 potentiometer. There is 1 figure.

Card 2/2

SHCHERBAK, S.K.; SKOROKHOD, G.A.

Main problems involved in the development of chemical engineering laboratories. Zav. lab. 30 no.11:1421-1422 '64 (MIRA 18:1)

1. Glavnyy inzh. TSentral'noy zavodskoy laboratorii khimicheskoy promyshlennosti. (for Shcherbak). 2. Zamestitel' nachal'nika TSentral'noy zavodskoy laboratorii khimicheskoy promyshlennosti. (for Skorokhod).

STORCHAK, I.M., nauchnyy rabotnik; SKOROKHOD, I.I., nauchnyy rabotnik, NIKIFOROV, G.V., mekhanik

Attachment for sharpening cutter bar knives of the SK-2,6 combine. Mekh.sil'.hosp. 10 no.7:10-12 Jl '59.
(MIRA 12:12)

1. Ukrainskiy nauchno-issledovatel'skiy institut mekhanizatsii i elektrifikatsii sel'skogo khozyaystva.
(Combines(Agricultural machinery))

SKOROKHOD, I. I.

ARTEM'YEV, Yu.N., kand. tekhn. nauk; ASTVATSATUROV, G.G., inzh.; BARABANOV, V.Ye., inzh.; BARYKOV, G.A., inzh.; BISNOVATYY, S.I., inzh.; GALAYEVA, L.M., inzh.; GAL'PERIN, A.S., kand. tekhn. nauk; GAL'CHENKO, I.I., inzh.; GONCHAR, I.S., kand. tekhn. nauk; DEGTYAREV, I.L., kand. tekhn. nauk; DYADYUSHKO, V.P., inzh.; YERMAKOV, I.N., inzh.; ZHOTKEVICH, T.S., inzh.; ZUSMANOVICH, G.G., inzh.; KAZAKOV, V.K., inzh.; KOZLOV, A.M., inzh.; KOROLEV, N.A., inzh.; KRIVENKO, P.M., kand. tekhn. nauk; LAPITSKIY, M.A., inzh.; LEBEDEV, K.S., inzh.; LIBERMAN, A.R., inzh.; LIVSHITS, L.G., kand. tekhn. nauk; LOSEV, V.N., inzh.; LUKANOV, M.A., inzh.; LYUBCHENKO, A.M., inzh.; MAMEDOV, A.M., kand. tekhn. nauk; MATVEYEV, V.A., inzh.; ORANSKIY, N.N., inzh.; POLYACHENKO, A.V., kand. tekhn. nauk; POPOV, V.P., kand. tekhn. nauk; PUSTOVALOV, I.I., inzh.; PYTCHENKO, P.I., inzh.; PYATETSKIY, B.G., inzh.; RABOCHIY, L.G., kand. tekhn. nauk; ROL'BIN, Ye.M., inzh.; SELIVANOV, A.I., doktor tekhn. nauk; SEMENOV, V.M., inzh.; SKOROKHOD, I.I., inzh.; SLABODCHIKOV, V.I., inzh.; STORCHAK, I.M., inzh.; STRADYMOV, F.Ya., kand. tekhn. nauk; SUKHINA, N.V., inzh.; TIMOFEYEV, N.D., inzh.; FEDOSOV, I.M., kand. tekhn. nauk; FILATOV, A.G., inzh.; KHODOV, L.P., inzh.; KHROMETSKIY, P.A., inzh.; TSVETKOV, V.S., inzh.; TSEYTLIN, B.Ye., inzh.; SHARAGIN, A.M., inzh.; CHISTYAKOV, V.D., inzh.; BUD'KO, V.A., red.; PESTRYAKOV, A.I., red.; GUREVICH, M.M., tekhn. red.

[redacted]

Manual on the repair of machinery and tractors. (Spravochnik po remontu mashinno-traktornogo parka. Pod red. A. I. Selivanova. Moskva, Sel'khozizdat. Vols.1-2, 1962. **(MIRA 15-6)**

SKOROKHOD, I.V.

"Importance of the Visual Conditioned Reflex Component of Gastric Secretion," Voprosy Fiziologii, No 6, 1953, pp 40-49

The gastric secretions of dogs were studied, while they were being fed with their eyes open or with them bandaged. There were four dogs with Basov fistulas and two dogs with "miniature stomach," according to I.P. Pavlov. In all cases, feeding while the eyes were bandaged produced only 30-60 percent of the normal secretion. After analyzing the data obtained, the author concluded that the nervous phase of gastric secretion is complex of phenomena among which conditioned-reflex irritations of receptors, especially the visual receptors, have an important place. (RZhBiol, No 6, 1954)

SO: Sum. No. 536, 10 Jun 55

SKOROKHOD, O. F.

Defended his Dissertation for Candidate of Chemical Sciences, Belorussian State University, Minsk, 1953

Dissertation: "Mutual Displacement of Acids and Selective Adsorption"

SO: Referativnyy Zhurnal Khimiya, No. 1, Oct. 1953 (W/29?55, 26 Apr 54)

Effect of the nature of the substituent and its position in the molecule on the adsorption of organic acids. N. F. Ermolenko and O. R. Skorokhod. *Uchenye Zapiski Beloruss. Gosudarst. Univ. im. V. I. Lenina, Ser. Khim.* 1954, No. 20, 165–72.—Aq. solns. of substituted benzoic acids were shaken with charcoal. The amt. of adsorption fitted the Freundlich isotherm well. The amt. of adsorption increased in the following order of substituents: *o*-NO_2, *o*-Cl, *o*-OH, *m*-NO_2 and *p*-NO_2 very close together, *o*-Me, *p*-Me. This is in order of decreasing ionization consts. and is related to the electronegativity of the substituent with groups in the ortho position being especially active. L. H. E.

3

SKOROKHOD; O.R.

2

Adsorption of mixtures of organic acids on carbon from aqueous solutions. N. F. Ermolenko and O. R. Skorokhod. Uchenye Zapiski, Beloruss. Gosudarst. Univ. im. V. I. Lenina, Ser. Khim. 1955, No. 24, 83-89.—Adsorption of org. acids from aq. solns. on activated wood charcoal (0.15-0.25 mm.; contg. 0.681% ash) was measured as a function of concn. The acid mixts. studied were of salicylic and oxalic, malonic, succinic, or adipic acids. The mole % of salicylic acid in the solute varied between 25 and 75%, and the total concn. from 0.100 to 0.400 mM. The variations of the adsorption isotherms with solute compn. and total concn. are given. In all cases the salicylic acid is preferentially adsorbed. The lower-mol.-wt. acids were adsorbed less than the higher-mol.-wt. acids. G. H. Fuchsman

SKOROKHOD, O.P.; YERMOLENKO, N.F.; FURSAYEVA, L.N.

Adsorption of mixtures of various amino acids from aqueous solutions on charcoal. Uch.zap. BGU no.29:121-132 '56. (MIRA 11:11)
(Amino acids) (Adsorption)

YERMOLENKO, N.F.; SKOROKHOD, O.R.

Adsorption of a mixture of aromatic acids on charcoal. Uch.zap. BGU no.29:210-221 '56. (MIRA 11:11)
(Carbon, Activated) (Acids, Organic) (Adsorption)

SKOROKHOD, O.R.; YERMOLENKO, N.F.; LUKOMSKAYA, N.

Combined adsorption from aqueous solutions of two aromatic acids. Uch.zap.BGU no.42:159-172 '58. (MIRA 12:1)
(Acids, Organic) (Adsorption)

TISHCHENKO, I.G.; SKOROKHOD, O.R.; GRUCHENKOV, R.G.

Analytical characteristics of some oxyaminofuranones. Uch.zap.BGU no.42:173-188 '58. (MIRA 12:1)
(Furanones)

SKOROKHOD, O.R.; TISHCHENKO, I.G.; VOLNEYKO, I.N.

Photometric determination of titanium with 2-(-N-piperidino) isopropyl-4-hydroxytetrahydrofuran-3-one. Zhur. anal. khim. 16 no. 4:426-429 Jl-Ag '61. (MIRA 14:7)

1. V.I. Lenin Byelorussian State University, Minsk.
(Titanium—Analysis)

SKOROKHOD, O.R.; SERGEYEVA, L.M.

Molecular sorption of some aromatic acids on ion exchangers.
Koll. zhur. 23 no.1:100-105 Ja-F '61. (MIRA 17:2)

1. Belorusskiy universitet imeni Lenina, Minsk.

SKOROKHOD, O.R.

Sulfonated elastomers as sorbents of weak electrolytes.
Koll.zhur. 23 no.5:621-625 S-O '61. (MIRA 14:9)

1. Belorusskiy universitet im. V.I. Lenina, Minsk.
(Ion exchange resins)

SKOROKHOD, O.R.; TISHCHENKO, I.G.

Colored complexes of tetrahydroxyaminofuranones with metals.
Zhur.ob.khim. 31 no.6:1986-1991 Je '61. (MIRA 14:6)

1. Belorusskiy gosudarstvennyy universitet imeni V.I.Lenina.
(Furanone) (Complex compounds)

TISHCHENKO, I.G.; SKOROKHOD, O.R.; SHEDOV, N.V.

Metallic compounds of 2-(α,N-piperidino) -4-isopropylhydroxytetrahydro-3-furanone. Zhur.ob.khim. 32 no.11:3808-3811 N '62. (MIRA 15:11)

1. Belorusskiy gosudarstvennyy universitet imeni V.I. Lenina.

(Furanone)
(Organometallic compounds)

SKOROKHOD, O.R.; TISHCHENKO, I.G.

Extraction-photometric determination of molybdenum by means of 2-(-N-piperidine)isopropyl-4-hydroxytetrahydro-3-furanone. Trudy Kom.anal.khim. 14:292-297 '63. (MIRA 16:11)

S/069/63/025/001/005/008
B101/B186

AUTHORS: Skorokhod, O. R., Soroka, Ye. V.

TITLE: Sorption of phenols by ion exchange resins

PERIODICAL: Kolloidnyy zhurnal, v. 25, no. 1, 1963, 72-76

TEXT: This is a study on the sorption of phenol, 2,4-dinitrophenol, and 2,4,6-trinitrophenol by sulfonated КУ-1 (KU-1) and СБС (SBS) cationites, sulfonated coal, carboxylated КБ-4П-2 (KB-4P-2) cationites, АН-2Ф (AN-2F) anionites, and Dowex-2. Its purpose was to find ionites suited for the sorption of phenols and to examine the possibility of a chromatographical separation of phenols and nitrophenols. Results: Dowex-2 had the largest and KB-4P-2 had the lowest adsorption power. As to their adsorption power, the above cationites form the sequence: KB-4P-2 < KU-1 < sulfonated coal < SBS. Adsorption by the last two was more intensive than by AN-2F. The sorption power and the swelling capability of the ionite were affected by its metal ions. No relation was found between sorption power and swelling capability. The sorption power of sulfonated coal and KB-4P-2 decreased as the ionic radius increased and the ionic potential

Card 1/2

SKOROKHOD, O.R.; TABULO, M.L.

Sorption of some weak electrolytes and nonelectrolytes on ion exchangers. Koll.zhur. 25 no.6:674-678 N-D '63. (MIRA 17:1)

1. Belorusskiy universitet imeni Lenina, Minsk.

ACCESSION NR: AP4011312 S/0069/64/026/001/0100/0104

AUTHORS: Skorokhod, O.R.; Tabulo, M.L.; Dorofeyeva, L.I.

TITLE: Effect of thermal treatment on the sorption capacity of sulfonated butadiene-styrene cation exchanger (SBS)

SOURCE: Kolloidny*y zhurnal, v. 26, no. 1, 1964, 100-104

TOPIC TAGS: sulfonated butadienestyrene cation exchanger, cation exchanger SBS, sorption capacity, thermal treatment

ABSTRACT: A study of the effect of thermal treatment of the sulfonated cation exchanger SBS on its ability to sorb phenol, trinitrophenol, and the o-, m-, and p-isomers of nitrobenzoic and aminobenzoic acids showed that preliminary heating of the SBS in an electric tube furnace in an atmosphere of superheated steam at 200C lowers the sorption of aminobenzoic acids per unit weight of exchanger, and augments its capacity to sorb phenol, trinitrophenol and the nitrobenzoic acids. The sorption of aminobenzoic acids

ACCESSION NR: AP4011312

parallels the changes in concentration of the sulfo groups in the ionite. A possible sorption mechanism of the above comounds on ion exchangers is discussed. Orig. art. has: 4 figures and 1 table.

ASSOCIATION: Belorusskiy universitet im. V.I. Lenina, Minsk (Belorussian University)

SUBMITTED: 12Jul62 DATE ACQ: 14Feb64 ENCL: 00

SUB CODE: MA NO REF SOV: 007 OTHER: 002

Card 2/2

L 10521-66 EWT(m)/ETC/EWG(m)/EWA(h) DS/RM

ACC NR: AP5027180 SOURCE CODE: UR/0076/65/039/010/2553/2558

55 44 55 44 72

AUTHOR: Skorokhod, O. R.; Ovsyanko, L. M.

55 44 B

ORG: Belorussian State University im. V. I. Lenin (Belorusskiy gosudarstvenny universitet)

TITLE: Radiation resistance of ion-exchange resins

SOURCE: Zhurnal fizicheskoy khimii, v. 39, no. 10, 1965, 2553-2558

TOPIC TAGS: ionizing radiation, ion exchange, resin, irradiation resistance, physical chemistry property, chemical composition

ABSTRACT: A study was made of the effect of γ-radiation from Co^{60} on the sorption capacity of a sulfonated styrene-divinylbenzene copolymer (KU-2 cation exchange) with respect to benzoic acid, aniline, and pyridine. The samples of KU-2 were washed with hydrochloric acid and distilled water and then exposed to γ-radiation from Co^{60} at 150 r/sec at 17—20C in sealed ampules filled with the corresponding medium. After irradiation, the ion-exchanger was washed with water and dried. KU-2 subjected to γ-radiation of an integrated dose of 1.1×10^4 darkened, but did not suffer noticeable changes in properties. Its exchange capacity and swelling in water remained the same. A study of sorption kinetics under static conditions and the isothermic curves of sorption of benzoic acid, aniline, and pyridine showed that irradiation with a dose of 10^4 r hardly affected the sorption properties of KU-2 with respect to these substances. The breaking of C-S and the main C-C bonds

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ACC NR: AP5027180

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occurred during irradiation of KU-2 in the H form with an integrated dose of 10^8r. This caused the decrease of the exchange capacity of SO_3H-groups and increased swelling in water. The effect was much stronger when the irradiation was made in water and aqueous solution of nitric acid instead of air. The γ-irradiation had a different effect on sorption capacity with respect to benzoic acids, aniline, and pyridine. The sorption of benzoic acids on irradiated samples increased, while that of pyridine and aniline decreased after irradiation. The sorption of aniline and pyridine changed symbatically with changes in the concentration of sulfo groups in KU-2. In all cases studied the pyridine was sorbed in larger quantities than aniline. The sorption of benzoic acid increased with decreasing temperature. Orig. art. has: 4 figures and 2 tables. [19]

SUB CODE: 18, 07 SUBM DATE: 07Apr64/ ORIG REF: 014/ OTH REF: 001/ ATD PRESS: 4167

Card 2/2

TISHCHENKO, I.G.; SKOROKHOD, O.R.; SHILKOVA, L.F.

Interaction of 4-diphenyl-3-amino-3-methyl hydroxy-2-butanone with metals. Vestsi AN BSSR.Ser.khim.nav no.2:131-135 '65.
(MIRA 18:12)